

UNIVERSITY OF CALIFORNIA (Berkeley) LIBRARY  
IN THE DEPARTMENT OF BIOLOGICAL ENGINEERING

RESEARCH REPORT

UNIVERSITY OF CALIFORNIA

DEPARTMENT OF BIOLOGICAL ENGINEERING

UNIVERSITY OF CALIFORNIA, BERKELEY

1967

1100030747

PERPUSTAKAAN KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA (KUSTEM)			
Pengarang		No. Panggilan	
Judul		Tanda tangan	
Tarikh	Waktu Pemulangan	Nombor Ahli	Tanda tangan
7/8/06	3.55 pm	10532	*
12/8/06	11.30 pm	UK10532	
1/9/06	2.30 pm	UK10532	Jhm

1100030747

LP 5 FST 4 2004



1100030747

Micropropagation of Yam (*Dioscorea alata*) variety in Malaysia by tissue culture technique / Neow Sew Fong.



**PERPUSTAKAAN  
KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA  
21030 KUALA TERENGGANU**

**1100030747**


Lihat sebelah

HAK MILIK  
PERPUSTAKAAN KUSTEM

3

**MICROPROPAGATION OF YAM (*Dioscorea alata*) VARIETY IN  
MALAYSIA BY TISSUE CULTURE TECHNIQUE**

**By**

**Neow Sew Fong**

**Research Report submitted in partial fulfilment of  
the requirements for the degree of  
Bachelor of Applied Science (Biodiversity Conservation and Management)**

**Department of Biological Sciences  
Faculty of Science and Technology  
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA  
2004**

**JABATAN SAINS BIOLOGI  
FAKULTI SAINS DAN TEKNOLOGI  
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA**

**PENGAKUAN DAN PENGESAHAN LAPORAN  
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk Micropropagation of Yam (*Dioscorea alata*) Variety In Malaysia by Tissue Culture Technique oleh Neow Sew Fong, No Matrik UK 5526 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperoleh ijazah Sarjana Muda Sains Gunaan (Pemuliharaan Dan Pengurusan Biodiversiti), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:



Penyelia Utama

Nama: **PROF. MADYA DR. SAYED MOHD ZAIN S. HASAN**  
*Dekan*

Cop Rasmi: **Fakulti Agroteknologi dan Sains Makenan  
Kolej Universiti Sains dan Teknologi Malaysia  
21030 Kuala Terengganu**

Tarikh: 11.4.2004



Penyelia Kedua **DR. AZIZ BIN AHMAD (Ph.D)**  
**LECTURER**

Nama: **Dept of Biological Sciences  
Faculty of Science and Technology**

Cop Rasmi: **University College of Science  
and Technology Malaysia  
21030 Kuala Terengganu.**

Tarikh: 11.4.2004



Ketua Jabatan Sains Biologi

Nama: **PROF. DR. CHAN ENG HENG**  
*Ketua*

Cop Rasmi: **Jabatan Sains Biologi  
Fakulti Sains dan Teknologi  
Kolej Universiti Sains dan Teknologi Malaysia  
(KUSTEM)  
21030 Kuala Terengganu.**

Tarikh: 11.4.2004

## ACKNOWLEDGEMENT

First, I want to say thank you to my first supervisor Dr. Sayed Mohd Zain S. Hassan, because he had gave a lots of advise to me and guide me to do this project.

Second, I also want to say thank you to my second supervisor Dr Aziz Bin Ahmad, because he also had gave a lots of advice to me to do this project.

Besides that, I also want to say thank you to Encik Hassan as a lab assistant, because he had help me to grow the *Dioscorea alata* plant in KUSTEM.

At last, I want to say thank you to my fellows because they had help me took photo of my culture and share their experience about tissue culture with me.

## TABLE OF CONTENTS

List of Tables	v
List of Figures	vi
List of Symbols	vii
List of Appendices	ix
Abstract	x
Abstrak	xi
CHAPTER 1 INTRODUCTION	
1.1 Introduction	1
1.2 The Important of Micropropagation of Yams by Tissue Culture Technique	4
1.3 Objective	4
CHAPTER 2 LITERATURE REVIEW	
2.1 <i>Dioscorea alata</i>	5
2.1.1 Taxonomy of <i>Dioscorea. Alata</i>	5
2.1.2 Morphology of <i>Dioscorea. Alata</i>	6
2.1.3 The Habitat and Environmental Requirements of Yams	6
2.2 Uses of Yams	9
2.3 Micropropagation of Plant	10
2.3.1 The Reason for Applying Tissue Culture for Crop Improvement	11
2.3.2 What Is The 'Explants'	12
2.3.3 Media of Tissue Culture	12

2.3.4	Carbon Source, Temperature, pH of The Tissue Culture Media	14
2.3.5	Sterilization	14
<b>CHAPTER 3 MATERIALS AND METHODS</b>		
3.1	Location	16
3.2	Source of Explants	16
3.3	Media Preparation	17
3.4	Surface Sterilization	17
3.5	Sterilization of Explants	17
	3.5.1 Sterilization of Shoot tips	
	3.5.2 Sterilization of Tuber	18
3.6	Sterilization Treatment	18
3.7	Explants Transferring and Culture	20
3.8	Observation	20
3.9	Analysis of Data	20
3.10	Parameter	20
<b>CHAPTER 4 RESULT</b>		
4.1	General Observation	21
4.1.1	Shoot Tips and Axillary Bud Sterilization Treatment	21
4.1.2	Tuber Sterilization	22
4.2	Quantitative Observation	23
<b>CHAPTER 5 DISCUSSION</b>		
5.1	Shoot and Axillary Bud Sterilization Treatment	25
5.2	Tuber Sterilization	28



5.3	Establishment of The Tissue Culture	28
	CHAPTER 6 CONCLUSION	33
	REFERENCE	35
	APPENDICES	37
	VITAE	39

## ABSTRAK

Pembiakbakaan Yam (*Dioscorea alata*) Di Malaysia Dengan Teknik Tisu Kultur

Objektif kajian ini ialah kaji teknik pensterilan yang sesuai untuk pucuk dan tuber yam. .Yam selalu diserang oleh bacteria, virus dan kulat maka kultur yam yang bersih amat penting. Langkah penting dalam proses penghasilan kultur yam ialah aseptik teknik Agen pensterilan yang digunakan dalam kajian ini ialah Clorox yang mengandungi 5.25% (v/v) Natrium Hypochorite. Kajian pensterilan pucuk dijalankan dengan menggunakan rawatan 10%, 15%, 20% kepekatan Clorox disertai masa rawatan 10, 15, 20, 25, 30 minit masa perendaman. Dalam kajian ini, rawatan yang menggunakan 15% kepekatan Clorox disertai 25 minit masa peredaman adalah paling sesuai untuk pensterilan pucuk. Bagi ubi, rawatan pensterilan yang paling sesuai ialah penggunaan 100% Clorox disertai 30 minutes masa perendaman.

## **ABSTRACT**

The objective of this study was to optimize the sterilization technique for shoot tip, axillary bud and tuber explants of Yams for tissue culture. An aseptic technique for clean planting material is required since Yams are always affected by pathogen, viruses and fungus. The sterilization agent used in this study was Clorox which contained 5.25% (v/v) Natrium Hypochorite. The Clorox concentration for axillary bud and shoot tips treatment was started from 10% until 20% and immersion time in Clorox was from 10 minutes to 30 minutes. In this study the treatment with 15% concentration of Clorox and 25 minutes immersion time was the most appropriate treatment for sterilization shoot tips and axillary bud. For tuber, the most highest percentage of the explants free from contamination was obtained from the treatment with 100% concentration of Clorox and 30% minutes immersion time.